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Description

This invention relates to coupling devices and particularly to an apparatus for coupling external equipment to a seismic streamer cable.

In the art of marine seismic exploration, it has been generally recognized that it is important to accurately determine the depth and location of substantially every point along the length of the streamer cable to provide more precise data. Since the early attempts to control the depth of the streamer cable, such as through the use of a single drogue assembly drawn behind the cable, or through the use of spaced weights and floats, considerable effort has been expended to control the cable depth at a desired point. Early approaches included placing a diving plane mechanism at spaced intervals along the length of the cable. The mechanism was mounted directly onto the cable by clamping two halves together with a series of nuts and bolts. These devices were time consuming and difficult to remove and replace. Similarly, external devices have been used to determine the areal location of points along the streamer cable with respect to the towing vessel. Attempts to accomplish this end have been made by attaching pinger devices externally to the cable much in the same manner as were the diving planes.

External cable connectors widely used in the industry have been manufactured by Laitram Corporation of New Orleans, Louisiana, and Syntron, Incorporated of Houston, Texas. These latching mechanisms for coupling devices external the seismic cable generally consist of collars mounted around the streamer cable at desired locations. Each collar may include two parts: a cylindrical inner race formed of two half-cylinder members which are semi-circular in cross-section coupled together by screws. The inner race receives an outer race or locking collar formed of two half-cylinder members which are also semi-circular in cross-section and coupled together by screws. The locking collar is free to rotate around the inner race. The locking collar has a detent consisting of a pair of locking slots at diametrically opposed positions. The locking slots are designed to slidably receive a screw set at a predetermined height on a shank or bracket coupled to the external device. The distance between the shank and the head of the screw is set so that the head of the screw will just be received by the locking collar and allowed to slide along an inner surface, leaving the shank substantially tight against the collar. The screw is slid to one end of the locking slot so as to enable a pin to be insert into the locking slot through the action of a cam or spring. Cams or levers have been provided to lower the pin and allow the shank to slide off the collar. Such a connector is disclosed in U.S. Patent No. 3,931,608.

The cam operated pins in the mechanisms for coupling the external devices have the same problem as the diving planes. They require a tool to remove the shank from the collar. The spring operated pins have a disadvantage in that they provide a lever protruding from the side of the shank used to lower the pin which is exposed to ocean debris and may be inadvertently dislodged or lowered, allowing the shear stress inherent in such a system while under tow to be applied to the screw. This may result in failure of the latching mechanism and loss of the external device. Another disadvantage in the external lever or the spring-actuated latch is the turbulence generated do to their perpendicular orientation to the flow direction.

It is an object of this invention to provide a latching mechanism which does not require tools to attach or detach an external device to a streamer cable. It is another object of this invention to provide a latching mechanism which does not require tools to adjust the latching mechanism once the device has been attached and locked in place. It is yet another object of this invention to provide a latching mechanism which allows quick and efficient coupling and uncoupling of external devices. It is yet another object of this invention to provide a latching mechanism which is universally accepted by locking collars manufactured by others.

According to an aspect of the invention there is provided an apparatus for coupling a device to a marine cable, the apparatus comprising first mounting means arranged to be fixed to the cable and having an aperture therein, and second mounting means arranged to be fixed to the device and having pin means for receipt by the aperture of the first mounting means, the apparatus being characterised in that the second mounting means further comprises a locking member extending parallel to the pin means and having cam means arranged toward an end thereof for receipt by the aperture, there being means for rotating the cam when the cam means is received by the aperture between a locked position in which the locking member is secured in the aperture and an unlocked position in which the locking member can be removed from the aperture.

Embodiments of the invention may provide an apparatus for rapidly securing a device external to a cable. In particular, an apparatus may be provided which comprises a bracket or shank mounted to the device to be coupled to the cable. The bracket includes a detent extending from a coupling surface, laterally offset from a latching means disposed within the bracket. An end of the latching device and of the detent may be universally received within a locking bracket mounted on the

cable. A lever, extending through the side of the bracket, from the latching device, may be turned once the end of the latching means and detent are received within an aperture of the locking bracket. The latching means is rotated which prevents the end of the latching means from escaping from the locking bracket. A biasing means associated with the latching means, simultaneously draws the bracket up tight against the locking bracket, firmly retaining the detent within the aperture of the locking bracket, transferring shear stress from the bracket and device to the cable. The bracket is detached by simply moving the lever in the opposite direction which releases the end of the latching means from the aperture in the locking bracket.

A better understanding of the benefits and advantages of my invention may be obtained from the appended detailed description and the drawing figures described below, wherein:

Figure 1 is a general illustration of a marine seismic survey;

Figure 2 is an enlarged view of a portion of the seismic cable having an external device attached thereto;

Figure 3 is a general illustration of a locking collar;

Figure 4 is a elevational cross-sectional view of the inventive mechanism for coupling the external device to the streamer cable; and

Figure 5 is perspective view of the components comprising the invention.

In reference to the Figures, one is on notice that like reference numerals indicate like components which may vary slightly in design but function in essentially the same manner.

Figure 1 is a general illustration of a marine seismic survey. In such a survey technique, a ship 10 tows at least one seismic streamer cable 12 containing a plurality of seismic signal detectors disposed at known intervals along its length. The ship may tow several such streamer cables spaced parallel to one another and separated by predetermined distances controlled by booms or other devices well known in the art such as paravanes. The streamer cable often has external devices, generally indicated as 14, attached thereto such as diving planes to control the towing depth, or pingers used to determine the location and orientation of the streamer cable with respect to the ship. Often a combination of devices are attached at points along the length of the streamer cable.

Figure 2 is an enlarged view of a portion of the seismic cable having an external device 14 attached thereto. As shown in the Figure, the streamer cable 12 generally consists of a rubber tubular body 16 which encloses the sensors mentioned above, as well as their associated transmission lines and other components of the streamer cable. The exterior of the streamer cable body or skin 16 may have at least one, but preferably two, collars generally shown as 18 mounted thereon. The collars are mounted to the streamer cables after the cables themselves have been constructed. As mentioned earlier, various manufacturers supply the collars to the industry, usually associated with the respective device to be coupled to the cable exterior. Collars 18 from the different manufacturers are generally of the same design and may be made from plastics, stainless steel or other similar materials. Minor differences which do exist between particular manufacturer reside in the configuration and numbers of apertures designed to retain the coupling devices.

As generally shown in Figure 3, each locking collar 18 includes a cylindrical inner race 20 formed of two half-cylinder members 22 which are semi-circular in cross-section and mounted to each other by screws 24 or other suitable attaching means. The inner races 20 are mounted at desired positions with the streamer cable 12 and spaced from each other. The inner races 20 may be mounted over the cable 12 and held in place therewith by cement or by any suitable adhesive or between stops made from strips of tape wrapped around the cable exterior. The inner races 20 have a reduced diameter center section 26 located between shoulders 28 located along the edge. The center section 26 of the inner races 20 is adapted to receive an outer race or locking collar 30.

The locking collar 30 is preferably formed of two half-cylinder members 32 which are semi-circular in cross-section and mounted to each other by screws 24 or other suitable attaching means. The locking collar 30 is free to rotate about the inner race 20. This allows any device attached to the collar to seek its lowest gravitational position below the streamer cable. The locking collar 30 usually contains a pair of opposing locking apertures 34, each consisting of a forwardly located circular socket 36 trailed by a generally rectangular slot 38. Each portion 36 and 38 of the locking aperture 34 is designed to receive a different part of the latching mechanism to be described below.

Figure 4 is a elevational cross-sectional view of the inventive mechanism for coupling the external device to the streamer cable. Schematically shown in the upper half of the Figure is the streamer cable 12. Shown in cross-section along the streamer cable are a pair of the collars 18 generally showing the inner race 20 and the locking collar 30. Each locking collar 30, or bracket, is designed to receive another bracket or shank 40 which carries the device 14 to be coupled to the streamer cable 12. As seen in the Figure, each bracket 40 generally has an elongate block-like form and may be coupled to the device 14 by way of screws or bolts 42

passing entirely through holes 44 in he bracket. A leading and trailing edge of the bracket,46 and 48 respectively, may be tapered to form a bow and stern portion for streamlining purposes. A lower surface 50 of the mounting bracket may be designed to conform to device 14 again for streamlining purposes. An upper surface 52 of the bracket 40 may be designed to have a slightly concave trough to conform to the curve of the locking collar 30. The bracket or shank 40 may be made from a polycarbonate plastic, stainless steel, or material of similar strength characteristics. For the purposes of this discussion, it is preferred that polycarbonate plastic be used for machining purposes.

Figure 5 is a perspective cross-sectional view of the bracket 40 and the components comprising the invention. In one embodiment, at least one, but preferably a pair of closely spaced holes 54 and 56 may extend through the bracket 40 from the upper surface 52 to the lower surface 50. An elongate recess 58 may also be located along the lower surface 50 parallel to the length of the bracket and symmetrical with respect to the two holes. Holes 54 and 56 should be located along a center line C located down the length of the bracket 40. A transverse slot 60 may extend laterally in from one side of the bracket and intercept hole 56 furthest from the bow 46. The slot 60 may merge into a shallow depression 62 located along the exterior of the bracket slightly behind hole 56. An outer edge of the slot 60 may also contain a raised ridge or ramp 64 with the gradient decreasing from the bow to the stern of the bracket.

Shown in the hole 54 is a pin 66 of generally cylindrical form. The pin 66 has substantially the same diameter as hole 54 and may be constructed of stainless steel rod. The diameter of the upper end of the pin may not be greater than that of the socket 36 located in the locking collar 30. The lower end of the pin 66 may have an annular depression or channel 70 which is positioned adjacent the recess 58 in the lower surface of the bracket 40 when disposed in the hole 54. The pin 66 forms a projection or detent which extends above the upper surface 52 when properly positioned within hole 54 and is designed to transfer shear stresses to the collar 30.

Shown in the lower portion of Figure 5 is a latching means or lock 72 having a substantially cylindrical form and having a diameter substantially the same as hole 56. As in the case of the pin 66, it is preferred that the lock 72 be made from stainless steel rod. One end of the lock 72 tapers inward from the cylindrical body 74 to form a shaft 76 terminating in a cross or T-shaped cam or flange 78 of generally rectangular form. The longest dimension of the cross 78 may be of any dimension, but for the purposes of this embodiment, is no greater that the diameter of the body 74. The shortest dimension of the cross 78 is substantially equal to that of the shaft 76, but in no event is greater than the width of the slot 38 contained within the locking collar 30. The opposite end of the lock 72 also defines an annulus 80 very similar to that in the pin 66, but with a minor exception. The annulus 80 tapers gradually inward, thus the break between the smallest diameter of the annulus and the lower tapered surface occurs slightly higher than it occurred in the pin 66. The reasons for this will become apparent below.

A transverse hole 81 is defined entering the body of the lock 72 to receive a lever 82 after the lock 72 is located within the hole 56. The lever 82 extends from the lock 72 through the slot 52 defined in the side of the bracket 40, thus providing a means for rotating the lock 72 within the hole 56. The lever 82, at its furthest rearward arc of travel, may be received in the depression 62.

A bar spring 84 may be located within the recess 58 so as to pass through the annular portions of both the pin 66 and the lock 72. The spring 84 retains the pin 66 within the hole 54 to provide rapid exchange if a different shape or diameter pin 66 is desired. The spring 84 more importantly provides a downward bias upon the tapered portion of the lock 72 to force the lock towards its lowermost position restrained only by the position of the lever in the slot 56.

In the embodiment discussed above, the lever 82 is shown simply as a bar or rod, but it is to be understood that the handle portion of the rod may have a form which substantially fills the depression 62 with the handle in the closed position (moved towards the stern) to provide maximum streamlining benefits.

In another embodiment of the invention, pin 66 may be an integral part of the bracket 40. That is to say that the projection may be directly molded or machined from the material comprising the bracket.

In a contemplated best mode of operation, the bracket or shank 40, having the device 14 coupled thereto, may be coupled to the locking collar 30 simply by initially rotating the lock 72 so that the longest dimension of the cross 78 is parallel to the length of the bracket 40. The upper surface 52 of the bracket is placed adjacent the locking collar 30 such that the pin 66 is received by the forward socket 36, and the cross 78 of the lock is received by the slot 38. Once they are within the locking aperture 34, the lever 82 is moved rearward until resting within the depression 62. The lever rotates the lock 72 such that the longest dimension of the cross portion 78 within the locking aperture 34 is substantially perpendicular to the longitudinal axis of the slot 38. As the lever is moved rearward (or

forwards as the case may be) the decreasing gradient of the ramp 64 allows the tension of the spring 84 to draw the lock 72 and cross 78 downward upon the inner surfaces of the aperture 34, thus pulling the bracket 40 snugly against the collar 30. The downward action of the spring 84 also holds the pin 66 securely seated within the socket 36 and thereby transfers any shear stress to the streamer cable through the collar.

To detach the bracket 40 from the locking collar 30, the operator simply moves the lever outward to the forward most position. This removes the spring tension on the cross 78 and swings it parallel to the slot 38, allowing the cross to fall through the slot 38.

It is clear that the instant invention has applications for greater than in the field of seismic exploration. The coupling device may be used to couple pods to spacecraft, aircraft or submarines. The coupling mechanism may also be used for coupling equipment to racks or the like. The foregoing disclosure and description of the invention are illustrative and explanatory thereof, and various changes will occur to those skilled in the art in their respective fields which fall within the scope of this invention limited only by the restrictions called for in the specification and the appended claims.

Claims

1. An apparatus for coupling a device to a marine cable, the apparatus comprising first mounting means (18) arranged to be fixed to the cable (12) and having an aperture (34) therein, and second mounting means (40) arranged to be fixed to the device (14) and having pin means (66) for receipt by the aperture (34) of the first mounting means (18), the apparatus being characterised in that the second mounting means (40) further comprises a locking member (72) extending parallel to the pin means (66) and having cam means (78) arranged toward an end thereof for receipt by the aperture (34), there being means (82) for rotating the cam when the cam means (78, 76) is received by the aperture (34) between a locked position in which the locking member (72) is secured in the aperture and an unlocked position in which the locking member (72) can be removed from the aperture.

2. An apparatus according to claim 1, comprising means for retaining said locking member (72) within said second mounting means (40).

3. An apparatus according to claim 2, wherein the means for retaining comprises means engaging the locking member (72) at an end opposite the end toward which the cam means (78) is arranged for exerting a tensional force upon the locking member (72) within the second mounting means (40).

4. An apparatus according to claim 1, 2 or 3 comprising means (66) for retaining said pin means (66) within said second mounting means (40).

5. An apparatus according to any one of the preceding claims, wherein the first mounting means (18) comprises a first bracket (30) adapted to be coupled to said marine cable.

6. An apparatus according to claim 5, wherein said first bracket (30) comprises:
   (a) an inner collar defining an inner race (20), said inner collar having first and second semi-circular half portion 922) that couple with each other about said seismic cable;
   (b) an outer race defining a locking collar (30), said locking collar having a first and second semi-circular half portions (32) that couple about said inner race (20) and freely rotate thereabout along a single axis, each of said half portions (32) of said locking collar having said at least one of said apertures (34) therein; and
   (c) means for interconnecting said first and second half portions (22) of said inner collar about said seismic cable, and said locking collar (30) about said inner collar (20).

7. An apparatus according to any one of the preceding claims, wherein said second mounting means (40) comprises a second bracket adapted to be coupled to said device (14), said pin means (66) and locking member (72) being located on said second bracket.

8. An apparatus according to any one of the preceding claims, wherein said pin means (66) comprises a cylinder (74) disposed within said second mounting means.

9. An apparatus according to claim 8, wherein said cam means comprises a substantially rectangular flange (78) perpendicular to a shaft (76), the shaft having an axis concentric with the cylinder (74) and having a diameter substantially equal to said aperture.

10. An apparatus according to any one of the preceding claims, wherein said pin means (66) comprises a lug extending from a surface of said second mounting means (40).

11. An apparatus according to any one of the *preceding claims, wherein* said means for rotating (82) comprises a lever transversely extending from the locking member (72).

12. An apparatus according to *claim 11, wherein* the lever means extends from said locking member through a slot in the second mounting means to an exterior of said second mounting means (40).

13. An apparatus according to any one of the preceding claims, wherein the aperture (34) comprises a first portion (36) which is generally circular and a second portion (38) which is generally rectangular and has a longitudinal *axis parallel to a radial of said circular portion.*

Patentansprüche

1. Vorrichtung zum Verbinden einer *Einrichtung* mit einem Seekabel, wobei die Vorrichtung folgendes umfaßt: ein zur Befestigung an dem Kabel (12) angeordnetes erstes Befestigungsmittel (18), das eine Öffnung (34) aufweist, und ein zur Befestigung an der Einrichtung (14) angeordnetes zweites Befestigungsmittel (40), das ein Stiftmittel (66) zur Aufnahme von der Öffnung (34) des ersten Befestigungsmittels aufweist, dadurch gekennzeichnet, daß das zweite Befestigungsmittel (40) weiterhin ein *parallel zum Stiftmittel (66) verlaufendes* Sperrglied (72) umfaßt, das ein zu dessen einem Ende hin angeordnetes Nockenmittel (78) zur Aufnahme von der Öffnung (34) aufweist, wobei Mittel (82) vorhanden sind, um die Nocke zwischen einer gesperrten Stellung, in der das Sperrglied (72) in der Öffnung festgehalten wird, und einer entriegelten Stellung, in der das Sperrglied (72) aus der Öffnung entfernt werden kann, zu drehen, wenn das Nockenmittel (78, 76) von der Öffnung (34) aufgenommen wird.

2. Vorrichtung nach Anspruch 1, die Mittel zum Halten des Sperrglieds (72) im zweiten Befestigungsmittel *(40) umfaßt.*

3. Vorrichtung nach Anspruch 2, bei der das Haltemittel Mittel umfaßt, die das Sperrglied (72) an einem Ende in Eingriff nehmen, das dem Ende, zu dem hin das Nockenmittel (78) angeordnet ist, gegenüberliegt, um auf das Sperrglied (72) im zweiten Befestigungsmittel (40) eine Spannkraft auszuüben.

4. Vorrichtung nach Anspruch 1, 2 oder 3, die Mittel zum Halten des Stiftmittels (66) im zweiten Befestigungsmittel (40) umfaßt.

5. Vorrichtung nach einem der vorhergehenden Ansprüche, bei der das erste Befestigungsmittel (18) eine erste Klammer (30) umfaßt, die *zur Verbindung mit dem Seekabel* ausgelegt ist.

6. Vorrichtung nach Anspruch 5, bei der die erste Klammer (30) folgendes umfaßt:
   (a) eine einen Innenring (20) definierende Innenhülse, die einen ersten und zweiten halbrunden Halbabschnitt (22) aufweist, die um das seismische Kabel herum miteinander verbunden werden;
   (b) einen eine Sperrhülse (30) definierenden Außenring, wobei die Sperrhülse einen ersten und zweiten halbrunden Halbabschnitt (32) aufweist, die um den Innenring (20) herum verbunden werden und dort herum *entlang einer einzelnen Achse rotieren,* wobei jeder der Halbabschnitte (32) der Sperrhülse mindestens eine der Öffnungen (34) aufweist, und
   (c) Mittel, um den ersten und zweiten Halbabschnitt (22) der Innenhülse miteinander um das seismische Kabel herum und die Sperrhülse (30) um die Innenhülse (20) herum zu verbinden.

7. Vorrichtung nach einem der vorhergehenden Ansprüche, bei der das zweite Befestigungsmittel (40) eine zweite Klammer umfaßt, die zur Verbindung mit der Einrichtung (14) ausgelegt ist, wobei das Stiftmittel (66) und Sperrglied *(72) an der zweiten Klammer angebracht sind.*

8. Vorrichtung nach einem der vorhergehenden Ansprüche, bei der das Stiftmittel (66) einen im zweiten Befestigungsmittel angeordneten Zylinder (74) umfaßt.

9. Vorrichtung nach Anspruch 8, bei der das Nokkenmittel einen im wesentlichen rechteckigen Flansch (78) umfaßt, der senkrecht zu einem Schaft (76) steht, welcher eine Achse aufweist, die konzentrisch mit dem Zylinder (74) ist, und einen Durchmesser aufweist, der im wesentlichen gleich der Öffnung ist.

10. *Vorrichtung nach einem der vorhergehenden* Ansprüche, bei der das Stiftmittel (66) einen von einer Fläche des zweiten Befestigungsmittels (40) aus verlaufenden Ansatz umfaßt.

11. Vorrichtung nach einem der vorhergehenden Ansprüche, bei der das Drehmittel (82) einen quer vom Sperrglied (72) aus verlaufenden He-

bei umfaßt.

12. Vorrichtung nach Anspruch 11, bei der das Hebelmittel vom Sperrglied aus durch einen Schlitz im zweiten Befestigungsmittel zu einer Außenseite des zweiten Befestigungsmittels (40) verläuft.

13. Vorrichtung nach einem der vorhergehenden Ansprüche, bei der die Öffnung (34) einen im allgemeinen runden ersten Abschnitt (36) und einen im allgemeinen rechteckigen zweiten Abschnitt (38) umfaßt und eine parallel zu einer Radialen des runden Abschnitts verlaufende Längsachse aufweist.

Revendications

1. Un appareil pour accoupler un dispositif à un câble marin, l'appareil comprenant des premiers moyens de montage (18) agencés pour être fixés sur le câble (12) et comportant une ouverture (34), et des seconds moyens de montage (40) agencés pour être fixés sur le dispositif (14) et comprenant des moyens en forme d'axe (66) prévus pour se loger dans l'ouverture (34) des premiers moyens de montage (18), l'appareil étant caractérisé en ce que les seconds moyens de montage (40) comprennent en outre un élément de verrouillage (72) disposé parallèlement aux moyens en forme d'axe (66) et comportant des moyens en forme de came (78) agencés vers l'une de ses extrémités, venant se loger dans l'ouverture (34), des moyens (82) étant prévus pour faire tourner la came lorsque les moyens en forme de came (78, 76) sont logés dans l'ouverture (34), entre une position verrouillée, dans laquelle l'élément de verrouillage (72) est bloqué dans l'ouverture, et une position déverrouillée, dans laquelle l'élément de verrouillage (72) peut être retiré de l'ouverture.

2. Un appareil selon la revendication 1, comprenant des moyens pour retenir ledit élément de verrouillage (72) dans les dits seconds moyens de montage (40).

3. Un appareil selon la revendication 2, dans lequel les moyens de retenue comprennent des moyens engageant l'élément de verrouillage (72) en prise dans une extrémité opposée à l'extrémité vers laquelle les moyens en forme de came (78) sont agencés, pour exercer une force de traction sur l'élément de verrouillage (72) dans les seconds moyens de montage (40).

4. Un appareil selon la revendication 1, 2 ou 3, comprenant des moyens (66) pour retenir lesdits moyens en forme d'axe (66) dans lesdits seconds moyens de montage (40).

5. Un appareil selon l'une quelconque des précédentes revendications, dans lequel les premiers moyens de montage (18) comprennent un premier support (30) agencé pour être accouplé audit câble marin.

6. Un appareil selon la revendication 5, dans lequel ledit premier support (30) comprend :
   (a) un collier intérieur définissant une portée d'appui intérieure (20), ledit collier intérieur comprenant des première et deuxième moitiés semi-circulaires (22) accouplées ensemble autour dudit câble marin ;
   (b) une portée d'appui extérieure définissant un collier de verrouillage (30), ledit collier de verrouillage comprenant des première et deuxième moitiés semi-circulaires (32) accouplées autour de ladite portée d'appui intérieure (20) et tournant librement autour de cette dernière le long d'un axe unique, chacune desdites moitiés (32) dudit collier de verrouillage comprenant, au moins, l'une desdites ouvertures (34) ménagées à l'intérieur; et
   (c) des moyens pour raccorder lesdites première et deuxième moitiés (22) dudit collier intérieur autour dudit câble marin, et ledit collier de verrouillage (30) autour dudit collier intérieur (20).

7. Un appareil selon l'une quelconque des précédentes revendications, dans lequel lesdits seconds moyens de montage (40) comprennent un deuxième support, agencé pour être accouplé audit dispositif (14), lesdits moyens en forme d'axe (66) et l'élément de verrouillage (72) étant disposés sur ledit deuxième support.

8. Un appareil selon l'une quelconque des précédentes revendications, dans lequel lesdits moyens en forme d'axe (66) comprennent un cylindre (74) disposé dans lesdits deuxièmes moyens de montage.

9. Un appareil selon la revendication 8, dans lequel lesdits moyens en forme de came comprennent une came sensiblement rectangulaire (78), perpendiculaire à un arbre (76), dont l'axe est concentrique au cylindre (74) et le diamètre sensiblement égal à ladite ouverture.

10. Un appareil selon l'une quelconque des précédentes revendications, dans lequel lesdits

moyens en forme d'axe (66) comprennent un ergot s'étendant à partir d'une surface desdits seconds moyens de montage (40).

11. Un appareil selon l'une quelconque des précédentes revendications, dans lequel lesdits moyens d'entraînement à rotation (82) comprennent un levier disposé transversalement, à partir de l'élément de verrouillage (72).

12. Un appareil selon la revendication 11, dans lequel les moyens formant levier s'étendent à partir dudit élément de verrouillage, à travers une fente des deuxièmes moyens de montage, jusqu'à l'extérieur desdits deuxièmes moyens de montage (40).

13. Un appareil selon l'une quelconque des précédentes revendications, dans lequel l'ouverture (34) comprend une première partie (36), généralement circulaire, et une deuxième partie (38), généralement rectangulaire, et dont l'axe longitudinal est parallèle à un rayon de ladite partie circulaire.

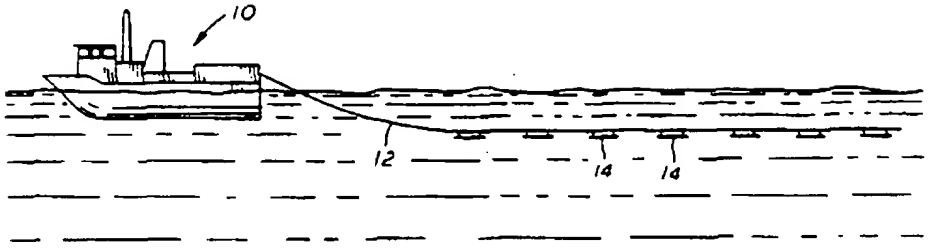

FIG. 1

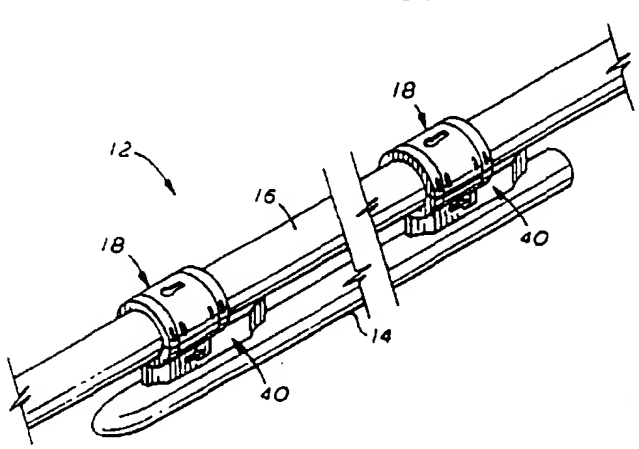

FIG. 2

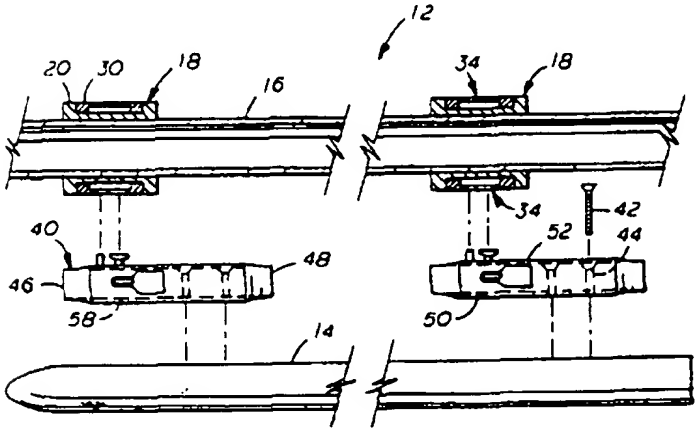

FIG. 4

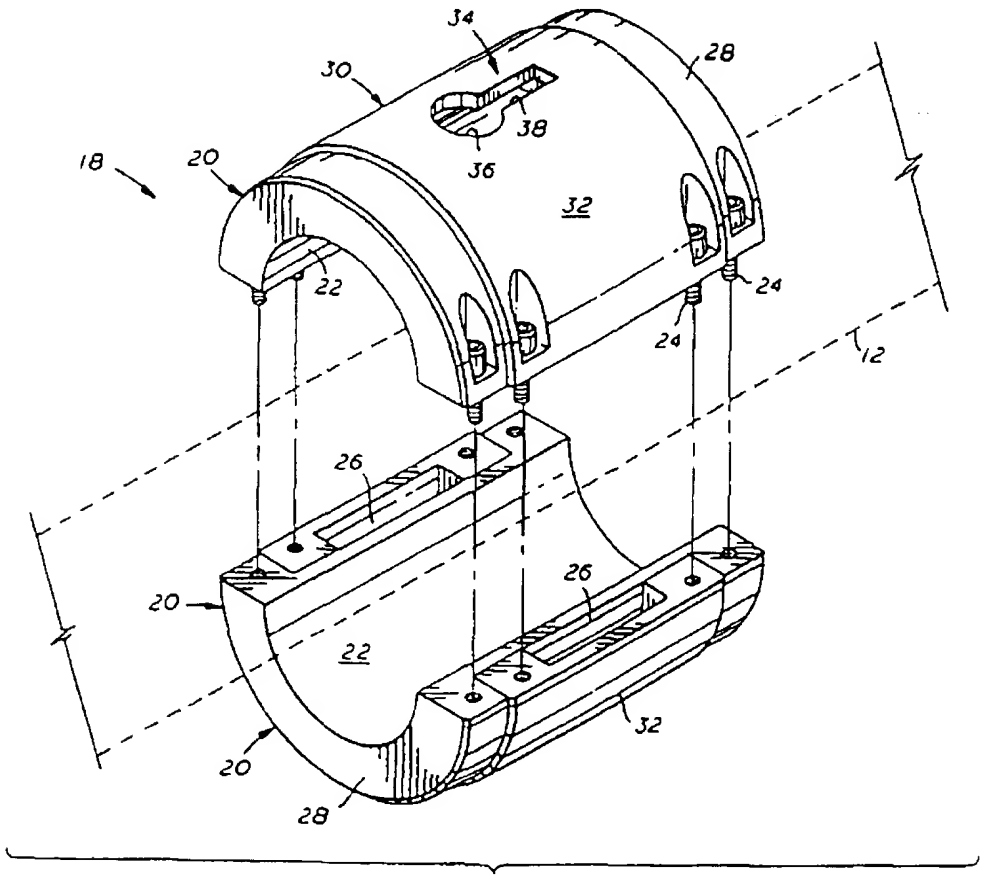

FIG. 3

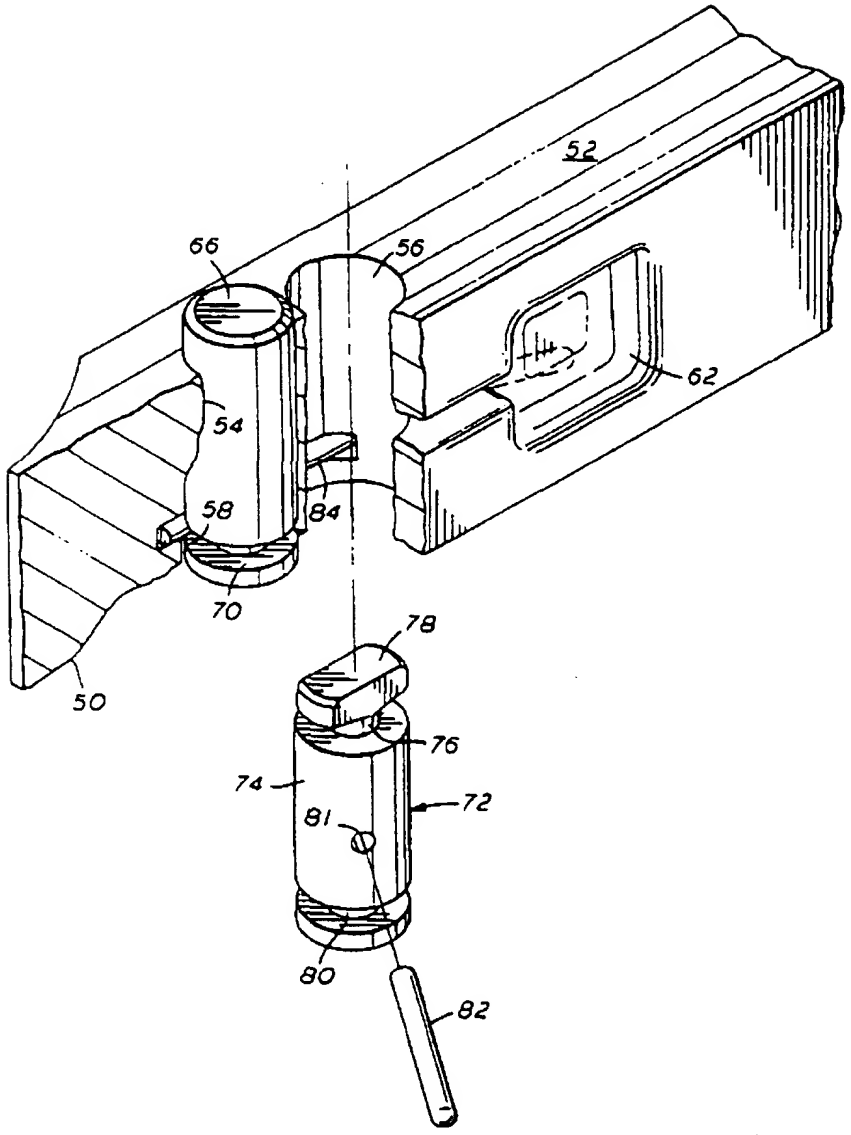

FIG. 5

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